FIGS. **9***b* and **9***c*. Additionally, the second device part **350** can use the anchoring section **72** as pivot to rotate along the y axis, as shown in FIG. **9***d*.

In sum, the optical hinge of the present invention has a first hinge part and a second hinge part. Each of the first and second hinge parts has a connecting section and an anchoring section. The connecting sections can be movably coupled to each other so as to allow one connecting section to slide against the other while maintaining the electrical and optical links. Advantageously, both connecting sections are concentrically constructed so as to allow one connecting section to rotate against the other, in addition to the sliding motion. Each of the connecting sections has a first and a second cylindrical layer of an electrically conductive material. The conductive layers in the first hinge part are dimensioned to provide electrical contacts to the corresponding conductive layers in the second hinge part whether the connecting sections are fully engaged or partially engaged with each other. Each of the first and second hinge parts has a centrally located optical fiber so as to allow optical signals to be conveyed between the first and second hinge parts when the connecting sections are fully or partially engaged. The optical hinge, according to the present invention, can be used as a mechanical coupling means to allow one device part to move relative to another device part. The relative movement can be a sliding motion or a rotational motion.

It should be noted that when the device parts are not required to rotate against one another as illustrated in FIGS. **8***a* to **8***b*, the cross section of connecting sections **30** and **70** is not necessarily circular as depicted in FIGS. **2***b* and **3***b*. The cross section can be elliptical, rectangular or any shape, so long as the cross section is constant over each of the connecting sections. Furthermore, each of the electrically conductive layers **14**, **18**, **52** and **56** does not necessarily form a complete loop like a tube. Each layer can be one or more elongated segments wide enough to provide electrical contact with its counterpart even when the connecting sections are caused to rotate against one another.

It is possible that there is only one electrically conductive layer in each of the connecting sections **30** and **70**. As shown in FIG. **10***a*, the connecting section **30** has only one electrically conductive layer **18**. Similarly, the connecting section **70** also has only one electrically conductive layer **56**. Moreover, it is also possible that three or more electrically conductive layers are provided in each of the connecting sections **30** and **70**. As shown in FIG. **11***a*, the connecting section **30** has an additional electrically conductive layer **25** surrounding the insulation jacket **12**. As shown in FIG. **11***b*, the connecting section **70** has a corresponding electrically conductive layer **55** concentrically provided around the inner layers. The inner diameter of third electrically conductive layer **55** is substantially equal to the outer diameter of the electrically conductive layer **25**. The concentric space **53** between the electrically conductive layers **52** and **55** in the connecting section **70** allows the layers **25**, **12** and **14** of the connecting section **30** to be inserted into the space **53**, while the optical fiber **20** and the electrically conductive layer **18** are inserted into the space **64** in the connecting section **70**.

Thus, although the present invention has been described with respect to one or more embodiments thereof, it will be understood by those skilled in the art that the foregoing and various other changes, omissions and deviations in the form and detail thereof may be made without departing from the scope of this invention.

What is claimed is:

1. A hinge comprising:

a first hinge part having a first coupling section, the first coupling section having at least a section body with a constant cross section; and

a second hinge part having a second coupling section, the second coupling section having at least a section body with a constant cross section, dimensioned for mechanically engaging with the first coupling section such that the first and second coupling sections are slidable against one another to provide at least a first mechanical coupling position and a second mechanical coupling position while the first and section coupling sections remain engaged with one another, wherein

the first coupling section comprises at least one electrically conductive layer and a first optical conduit; and

the second coupling section comprises at least one electrical conductive segment and a second optical conduit, and wherein

the electrically conductive layer is in electrical contact with the electrical conductive segment when the first and second coupling sections are in the first mechanical coupling position and in the second mechanical coupling position; and

the first optical conduit is positioned relative to the second optical conduit for conveying optical signals, when the first and second coupling sections are in the first mechanical coupling position and in the second mechanical coupling position.

2. The hinge of claim **1**, wherein

the cross section of the first coupling section is circular and the cross section of the second coupling section is circular.

3. The hinge of claim **2**, wherein the first coupling section further comprises a second electrically conductive layer spaced from the electrically conductive layer; and

the second coupling section further comprises a second electrical conductive segment spaced from the electrically conductive segment, and wherein

the second electrically conductive layer is in electrical contact with the second electrical conductive segment when the first and second coupling sections are in the first mechanical coupling position and in the second mechanical coupling position.

4. The hinge of claim **2**, wherein at least part of the first optical conduit is located substantially in a center section of the cross section of the first coupling section and at least part of the second optical conduit is located substantially in a center section of the cross section of the second coupling section.

5. The hinge of claim **4**, wherein the electrically conductive layer is disposed around the first optical conduit, the electrically conductive layer having an outer diameter and the electrically conductive segment is disposed in the section body of the second coupling section, the electrically conductive segment having an inner diameter dimensioned to match the outer diameter of the electrically conductive layer.

6. The hinge of claim **3**, wherein

at least part of the first optical conduit is located substantially in a center section of the cross section of the first coupling section;

at least part of the second optical conduit is located substantially in a center section of the cross section of the second coupling section;

the electrically conductive layer is disposed around the first optical conduit, the electrically conductive layer having an outer diameter; and